



United States Department of Agriculture

Margaret Creek Watershed Restoration and Enhancement Project

Environmental Assessment



Forest Service
Alaska Region

Tongass National Forest
Ketchikan Misty Fjords Ranger District

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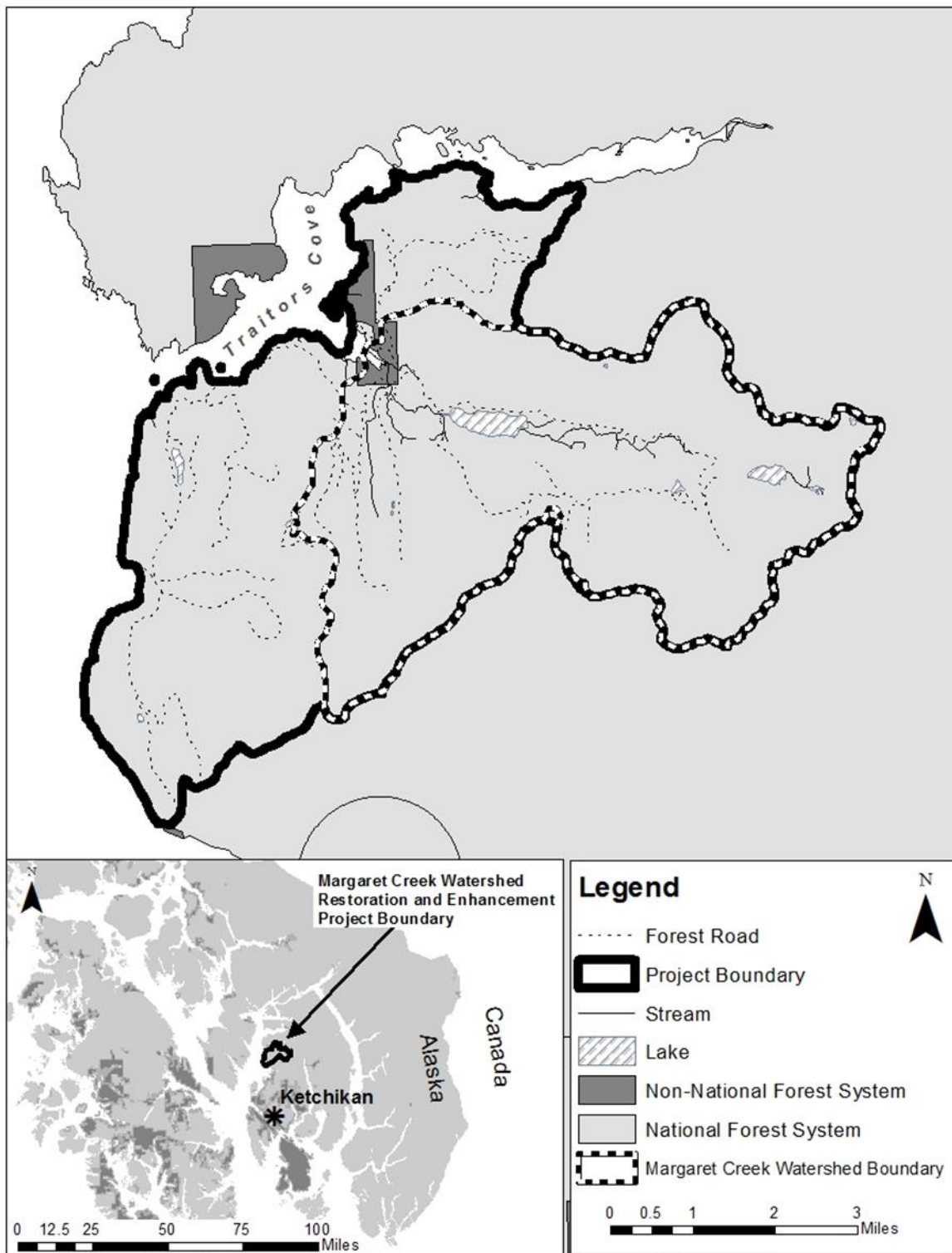


Figure 1. Vicinity map

Introduction

The USDA Forest Service proposes to restore watershed health, enhance fish and wildlife habitat, enhance recreation opportunities, and maintain plant communities in the Margaret Creek project area, which includes the Margaret Creek Watershed and surrounding area connected to the Margaret road system (Figure 1). This environmental assessment (EA) has been prepared for the Margaret Creek Watershed Restoration and Enhancement Project to analyze and disclose potential effects of proposed activities. The project area is located on the Ketchikan Misty Fjords Ranger District, Tongass National Forest, on Revillagigedo Island between the Traitors Cove and Naha Inlets approximately 22 miles northwest of Ketchikan, Alaska (Figure 1).

Past management in the Margaret Creek project area has disconnected streams from their natural floodplains, reduced large wood critical to stream health, and diminished sources of large instream woody material. Additionally, culverts impede fish passage and past actions have introduced invasive plant species reducing the quality and quantity of wildlife habitat. Because of the close proximity to Ketchikan, there is public demand for access and additional recreational opportunities for permitted (guided) use, and local recreation and subsistence use on National Forest System (NFS) lands.

On January 19, 2018, the Forest Supervisor designated Margaret Creek Watershed as a priority watershed for restoration on the Tongass National Forest (PR 835_0072).

Public Involvement and Tribal Consultation

During public open house meetings for the North Revillagigedo Integrated Resource Project in 2016 and 2017, the proposed project was presented as an opportunity to enhance water quality and the salmon fishery in the Margaret Creek Watershed. During the meetings, the public expressed an interest in increased accessibility and recreation opportunities in this area, and fully supported restoration activities.

On June 8, 2017 permittees (outfitters and guides) were invited to meet and discuss the proposed activities, providing an opportunity to identify initial concerns they might have (PR 835_0100). They supported watershed restoration but expressed concern over timing of the work coinciding with the tourism season at the Margaret Creek Wildlife Observation Site. While recreation improvements were generally supported, opening the road for off-highway vehicle (OHV) use was a concern due to noise disturbing their clients and potentially driving wildlife away from the area of the wildlife viewing platform (PR 835_0077).

District staff met with the Ketchikan High School Youth Advisory Council (YAC) in 2017 (March 23, November 2, and December 14) to engage local youth about the project, and to introduce YAC members to the NEPA process and how to provide specific written comments on the EA.

A 30-day public scoping period was conducted, which was announced via a legal notice in the *Ketchikan Daily News* on August 29, 2017. Since then, project information has been provided on the project webpage at: <https://www.fs.usda.gov/project/?project=51782>.

Three responses were received from interested parties during the 30-day public scoping. One comment offered background information on the project area, and two individual comments in support of the project. The letters are available on the project webpage and in the project record. No concerns were raised through public scoping that could not be addressed through mitigation and design.

Prior to publishing the preliminary EA and draft Decision Notice, internal scoping identified less-costly methods and additional opportunities that were not identified in Alternative 1, and Alternative 2 was developed.

Since March 2017, information on the Margaret Creek Watershed Restoration and Enhancement Project was made available to federally recognized tribes including the Ketchikan Indian Community, Organized Village of Saxman, Metlakatla Indian Community, and Cape Fox Native Corporation. Information was distributed through a monthly project update letter (PR 835_0060) and staff attended most Tribal Council and committee meetings. Opportunities for consultation were also provided. The preliminary EA was released to the tribes on March 26, 2019 for review and comment prior to publishing for public review. No comments were received.

In September 2017, the project was discussed in detail with Forest Service volunteers who have served as site hosts for the Margaret Wildlife Viewing Site for the past 8 years. The history of the site, actual use, and timing of bear activity was reviewed to identify sideboards for timing activities to reduce impacts on wildlife and the visiting public.

The preliminary EA was released for a 30-day public comment period on April 15, 2019. No comments were received.

Need for the Proposal

The need for this proposal originated from the Margaret-Traitors Integrated Resource Management Plan (IRMP) (PR 835_0029) completed in September 2015. The purpose of the Margaret-Traitors IRMP was to identify resource needs and opportunities in the Margaret Creek Watershed that could be pursued in future project analyses. The Margaret-Traitors IRMP identified existing conditions, desired future conditions based on Forest Plan standards and guidelines, and proposed an integrated set of activities to bring about the change from existing to desired conditions. The Margaret Creek Watershed Restoration and Enhancement project would address some of the resource needs and opportunities identified in the Margaret-Traitors IRMP. The Margaret Creek Watershed Restoration and Enhancement Project references the Margaret-Traitors IRMP, which is posted on the project webpage at:

<https://www.fs.usda.gov/project/?project=51782>.

Forest Plan direction relevant to the need for the proposal includes, but is not limited to the following goals and objectives.

- Maintain or restore the natural range and frequency of aquatic habitat conditions on the Tongass National Forest to sustain the diversity and production of fish and other freshwater organisms and provide for the continuation of subsistence uses and resources by rural Alaskan residents (Forest Plan, pages 2-3 and 2-5).

Margaret Creek is an important spawning and rearing stream for coho, pink, sockeye, and chum salmon, as well as Dolly Varden char, coastal cutthroat trout, and steelhead trout. Currently, Margaret Creek lacks necessary instream structure and complexity to maximize the potential range of fish habitat.

- Provide a range of recreation opportunities consistent with public demand, emphasizing locally popular recreation places and those important to the tourism industry (Forest Plan, pg. 2-4).

The public has voiced a need for increased access for recreation, subsistence and other opportunities along the areas of the West Behm Canal. Informal comments received from local visitors and permitted

outfitters and guides have included requests for improvements to interpretive kiosks and outhouses, and the dock in Margaret Bay.

- Maintain viable plant communities and populations that support the full range of naturally occurring flora (Forest Plan, pg. 2-4).

Invasive plants such as purple foxglove, oxeye daisy, common St. Johnswort, hairy cat's ear, and reed canarygrass need to be controlled or eradicated at the population source to prevent further spread.

- Maintain habitat capability sufficient to produce wildlife populations that support the use of wildlife resources for sport, subsistence, and recreational activities (Forest Plan, pg. 2-6).

Past harvest activities have reduced wildlife habitat quantity, quality, and connectivity. This project would reestablish critical elements of stream structure and enhance wildlife habitat quality and quantity in upland young-growth stands, improving sport and subsistence hunting and fishing opportunities.

Alternatives

The USDA Forest Service proposes to restore watershed health and fish habitat, enhance recreation opportunities, maintain plant communities, and enhance wildlife habitat in the Margaret Creek project area on NFS lands (Figures 1 and 2). Land use designations (LUDs) include: Timber Production, Modified Landscape, Semi-remote Recreation, and Old-growth Habitat (Forest Plan, Chapter 3). Activities would be implemented beginning in fiscal year 2020 or as soon as the final decision is signed, and continuing for up to 10 years. All required permits and/or concurrence from State and Federal agencies would be obtained prior to implementation (e.g., Alaska Department of Fish and Game, U.S. Army Corps of Engineers). Mitigation and monitoring measures for Alternatives 1 and 2 are listed in table 1.

Alternative 1 – Proposed Action

Proposed activities include:

Restore Watershed Health and Fish Habitat

Instream Wood Placement

Single and multiple large wood pieces would be placed in Margaret Creek upstream and inland of Margaret Lake; and in Cobble Creek, a tributary to Margaret Creek downstream of Margaret Lake (Figures 2 and 3).

Portions of stored NFS roads 8000460 and 8000470 (Figures 2 and 3) and associated spur roads would be opened for heavy machinery and vehicle access to Margaret Creek for the duration of the proposed project. Opened roads would be returned to stored status after implementation, except where off highway vehicle (OHV) use is proposed (see Recreation Development Activities section below). Opening roads may include grading and resurfacing roads, brushing, improving drainage features, and installing temporary stream crossing structures where needed.

Whole trees¹ and logs selected for use in stream restoration would be removed from locations adjacent to the road system within the project area (Figure 2). Downed trees would be selected first, and followed by

¹ Whole trees include entire trunk with branches and roots (rootwad) attached; portions of the tree may be removed as situation demands.

intermittently falling live trees along the road system within the project area. In locations where more than one live tree is harvested, new openings would not exceed one-half (0.5) acre (Table 1). Defective live and hazard trees would be removed before marketable trees. Removal methods for whole trees with root-wads would follow guidelines established for similar projects in which heavy machinery is used to push selected trees over to maintain the root-wad connection (Landwehr 2009). In areas designated for hand placement² of large wood; logs and trees would be collected on site from the immediate area of restoration, or adjacent to the stream.

Trees would be transported along roads and taken to staging sites along NFS road 8000470, including spur roads near instream placement sites for final transport and placement (Figures 2 and 3) during the brief instream work window.

Heavy machinery, vehicles, and/or helicopters would be used to move the trees from the staging areas to large wood structure³ sites within the first 0.75 miles of Margaret Creek upstream of Margaret Lake (Figures 2 and 3). Access to the stream from existing spur roads would be over newly constructed temporary puncheon trails and vegetation mats (i.e., downed trees over soil). When instream restoration activities are complete, the materials used to construct the puncheon trails and vegetation mats would be scattered in the area. Helicopter and hand placement of logs and trees would be used in the Margaret Creek headwaters (i.e., beyond 0.75 miles above Margaret Lake) and in Cobble Creek.

Riparian Stand Treatment

Hand crews would treat riparian young-growth stands, using hand tools such as chainsaws, along Margaret Creek, above Margaret Lake (Figures 2 and 3), in accordance with the Tongass Young-growth Management Strategy (PR 835_0078).

Floodplain Connectivity

Heavy machinery would be used to obliterate the spur road and remove road fill within the active floodplain to improve drainage along the spur road connecting to NFS road 8000470 (Figure 3) and reconnect Margaret Creek watercourse to its historic floodplain.

Fish Blocking Culvert Treatment

Using heavy equipment and vehicles, up to nine culverts impeding fish passage would be removed and replaced as necessary on NFS roads 8000460, 8040000, and 8040700 (Figure 2).

Recreation Development Activities

Recreation enhancement activities (36 CFR 220.7(b)(2)(iv)) would be developed during and after watershed restoration activities. Timing of development would occur as sites are identified, funding becomes available, and as resources and equipment become available to conduct necessary development. Specific site locations and construction activities would be based on guidelines described in the Margaret Creek Watershed Restoration and Enhancement Project Recreation Adaptive Management Plan (PR 835_0079).

² Hand placement includes use of hand tools such as peaveys, manually cranked and small power winches, and rope pulleys to move and place wood collected onsite.

³ Structures consisting of one or more whole trees with or without rootwad, multiple cut logs, and individual rootwads; number of pieces within a structure and their placement design are site specific.

Dispersed Campsites

Up to 10 campsites with characteristics consistent with dispersed recreation (Forest Plan, p. 7-13) would be developed along roads and trails, lake shore, and saltwater access areas (Figure 2). Site leveling and access trails would be created with the tools used for other restoration activities, including small power tools such as hand-operated brushers and chainsaws, and other hand tools such as axes, rakes, and shovels. For sites adjacent to roads, heavy equipment would be used if available.

Picnic Areas

Picnic areas would be developed near the Margaret Bay log transfer facility (LTF) and the Margaret Creek upper bridge (Figure 2), and would include fire rings, cooking grills, picnic tables and benches. Facilities requiring in-ground installation, such as cooking grills would be installed by hand. Picnic areas would be cleared of brush using hand and power tools, and heavy equipment if available. Site leveling would occur as necessary using gravel or native soils.

Interpretative Kiosks

Interpretative kiosks would be installed, and existing kiosks updated along trails and roads (Figure 2). Kiosks would be consistent with Forest Service standards for informational displays found in Engineering Management series 7100-15 “Sign and Poster Guidance for the Forest Service” (PR 835_0081).

Three-Sided Shelter

A three-sided shelter would be constructed along NFS road 8000460 near an unnamed lake (Figure 2). The final location would be identified and any modifications would be made during final design (PR 835_0079).

Update Motor Vehicle Use Map

The 2008 Access and Travel Management Plan, as shown on the 2019 Motor Vehicle Use Map (MVUM), would be amended to allow off-highway vehicle (OHV) use on 6 miles of the currently closed NFS roads 8000460 and 8000470 (Figure 2) surrounding the Margaret Lake System.

Float Plane/ Boat Dock Expansion

The floatplane/boat dock in Margaret Bay would be expanded by 50 feet by adding a prefabricated rectangular float to the existing dock and pilings (Figure 2).

Invasive Species Treatments

Invasive plants would be treated along the road corridor (Figure 2). A variety of weed control methods would be used, including manual treatments (e.g., hand pulling, tarping), mechanical treatments (e.g., mowing, scraping, excavation), and use of herbicides (i.e., aminopyralid, and aquatic formulas of glyphosate). Treatment timing would be during the growing season (April – September).

Wildlife Enhancement Activities

Previously harvested timber stands would be treated using methods such as creating gaps, trails, thinning, and leave strips (Figure 2). Treatments would be implemented by hand crews with power tools.

Interpretive signs at the float dock and wildlife viewing site would be developed and/or enhanced in cooperation with recreation staff.

Alternative 2

More economical methods and additional opportunities were highlighted through internal scoping that were not identified in Alternative 1. In addition, there are concerns regarding OHV permitting and forest plan compliance; particularly conflicts with land use designations. The activities proposed in Alternative 1 are included in Alternative 2 with the following differences:

- the 2019 Motor Vehicle Use Map for the District would not be amended or updated to allow off-highway vehicle use as part of recreation development activities; and
- additional proposed activities that are described below.

All other proposed activities described in Alternative 1 are included in Alternative 2.

Watershed Health and Fish Habitat Activities

Instream Wood Placement

Spur roads off of NFS road 8000460 would be opened to stage trees and logs requiring placement by helicopter (Figures 4 and 5).

Fish-blocking Culvert Treatment

Fish passage would be restored as additional fish-blocking culverts are identified during project implementation. Culverts would be removed by blasting (on closed roads), in addition to heavy equipment; and culverts would be replaced where needed.

Floodplain Connectivity

Blasting would be added as a method to restore flood plain connectivity (Figure 5).

Landslide Restoration

If surveys identify the need, erosion control measures on NFS road 8040200 (Figure 4) would be implemented to stabilize soils. Erosion control measures may include seeding, catchment basin construction and drainage relief using heavy equipment to clear culverts and ditches. Annual monitoring would be conducted to ensure erosion control measures are operating as designed. Road-specific work would be prioritized and added to the Tongass Road Maintenance Plan.

Invasive Species Treatments

High-priority invasive plants (PR 835_0085) would be treated within riparian corridors of Margaret Creek, with herbicide and mechanical methods (Figures 4 and 5).

Recreation Development Activities

Existing outhouses would be removed and a new vault toilet outhouse would be installed at the Margaret wildlife viewing trailhead, and at the administrative cabin site (Figure 4).

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Table 1. Proposed activities and associated mitigation measures for watershed health, recreation, wildlife, and fish habitat activities. (*)Alternative 2 only.

Mitigation Measures and Monitoring	Instream Wood Placement	Riparian Stand Treatment	Fish Barrier Culvert Treatment	Floodplain Activities	Landslide Treatment	Invasive Species Treatments	Recreation Activities	Wildlife Activities
National Core BMP Technical Guide FS-990a (PR 835_0038)	Yes	Yes	Yes	Yes	Yes*	Yes	Yes	Yes
Alaska Region BMP - Alaska Region Soil and Water Conservation Handbook, Forest Service Handbook 2509.22 (PR 835_0007)	Yes	Yes	Yes	Yes	Yes*	Yes	Yes	Yes
Alaska Region Aquatic Habitat Management Handbook, Forest Service Handbook 2090.21 (PR 835_0022)	Yes		Yes	Yes	Yes*			Yes
Guidance for Invasive Plant Management Program, Tongass National Forest (i.e., Weed BMPs)	Yes		Yes	Yes	Yes*	Yes	Yes	Yes
Memorandum of Understanding with the Alaska Department of Fish and Game (PR 835_0084)	Yes		Yes	Yes	Yes*	Yes		
Special Publication No. 15-16: Instream Flow Protection in Alaska (PR 835_0070)	Yes		Yes	Yes	Yes*			
Technical Report No. 13-03: Alaska Blasting Standard for the Proper Protection of Fish. (PR 835_0080) (Alternative 2 only)			Yes*	Yes*				
Select and gather trees during the late fall and spring, as weather allows near areas of high visitor use	Yes							
Conduct assessment of existing detrimental soil conditions prior to rootwad harvest	Yes							
District specialist consultation to ensure ecological and economic objectives are met	Yes	Yes	Yes	Yes	Yes*	Yes	Yes	Yes
Selection of downed and defective live and hazard trees would be preferred over marketable trees	Yes			Yes				
Openings created when harvesting more than one live tree in a given area along NFS roads would not exceed one-half acre with no more than one opening per 1,000 feet of road and no more than 20 total openings	Yes							
Openings created when harvesting more than one live tree in a given area along spur roads off NFS roads - no more than one opening per 500 feet of road or six total openings	Yes							
Heavy equipment use would be timed to avoid areas of high visitor use	Yes		Yes	Yes			Yes	
Alaska State Law 18 AAC 90.630 regarding public notification of pesticide application to public places						Yes		
Herbicide treatment in high visitor use areas would be timed to reduce visitor exposure						Yes	Yes	

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Mitigation Measures and Monitoring	Instream Wood Placement	Riparian Stand Treatment	Fish Barrier Culvert Treatment	Floodplain Activities	Landslide Treatment	Invasive Species Treatments	Recreation Activities	Wildlife Activities
Use of only aminopyralid (maintain 10 foot buffer from water's edge) and aquatic formulations of glyphosate to water's edge (no buffer required)						Yes		
Herbicide application rates comply with label direction and permit requirements						Yes		
Routine monitoring	Yes	Yes	Yes	Yes	Yes*	Yes	Yes	
Temporary closure orders for visitor safety (only if necessary)	Yes			Yes			Yes	
Project Design Features for Herbicide Use & Aquatic Resources (see Appendix: Project Design Features, and PR 835_0020 and 835_0021)						Yes		
Project Design Features for Large Wood Placement and Instream Work (see Appendix: Project Design Features and PR 835_0027)	Yes	Yes	Yes	Yes	Yes*		Yes	Yes

Margaret Creek Watershed Restoration
and Enhancement Project

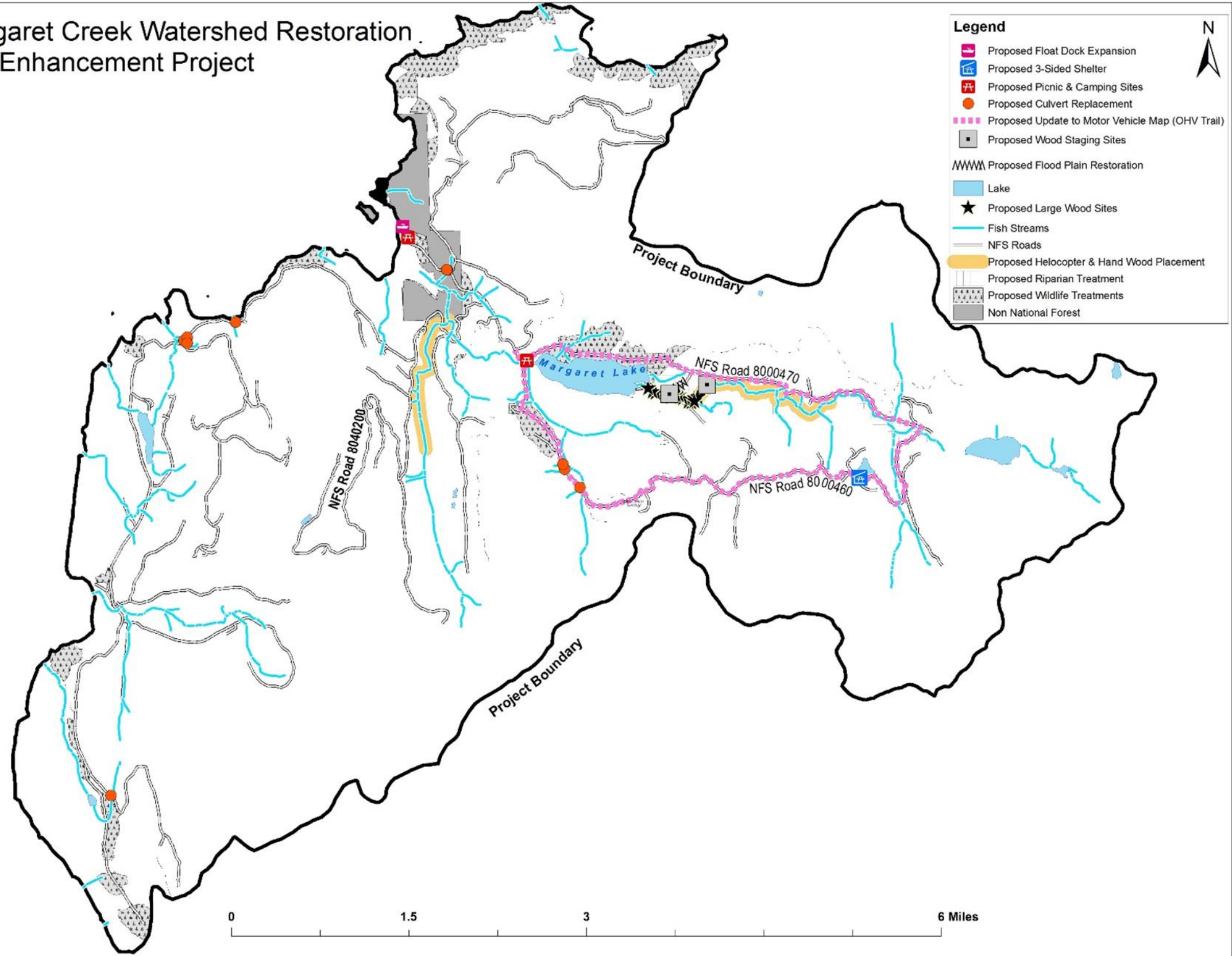


Figure 2. Proposed action

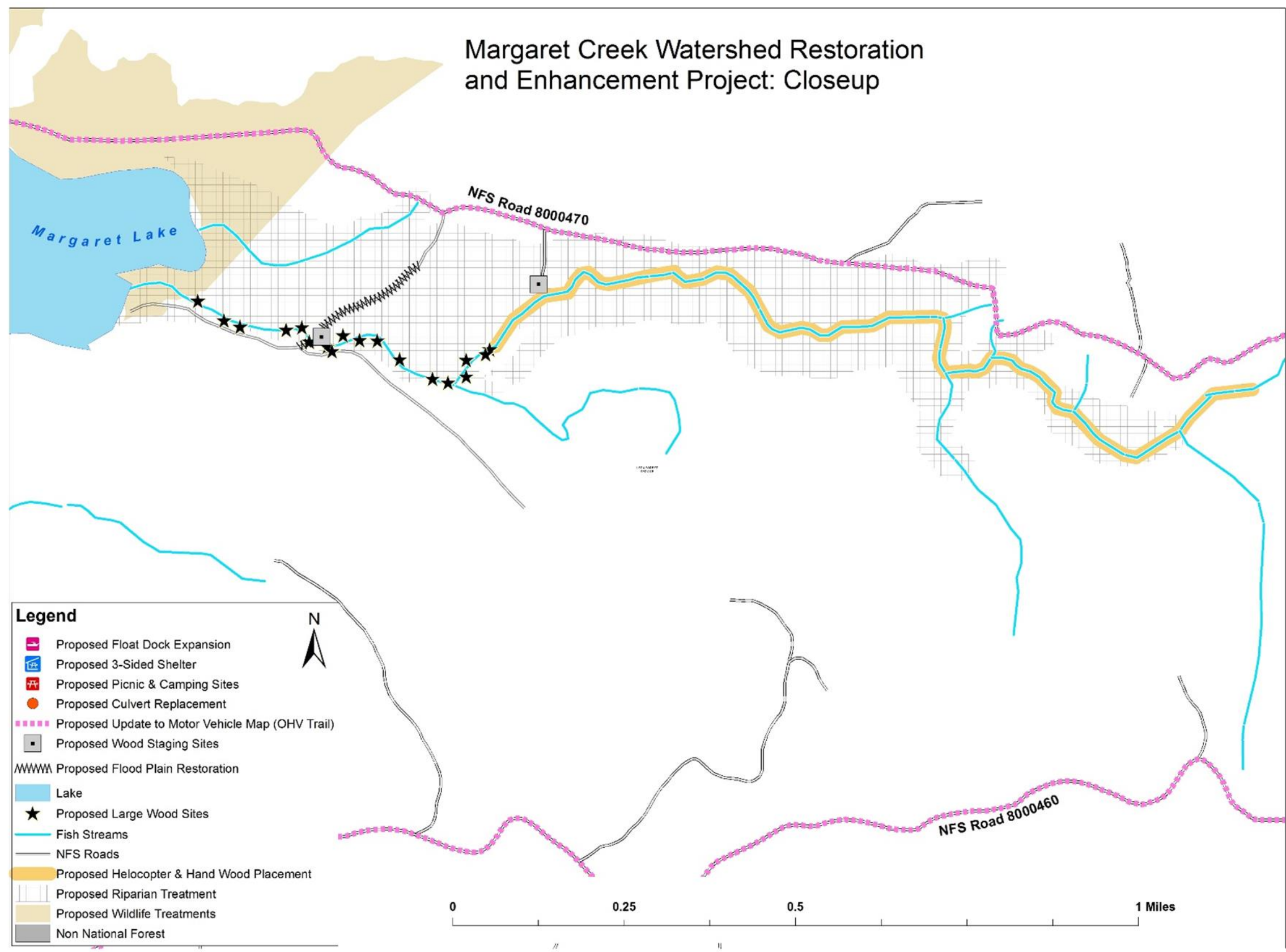


Figure 3. Proposed action closeup

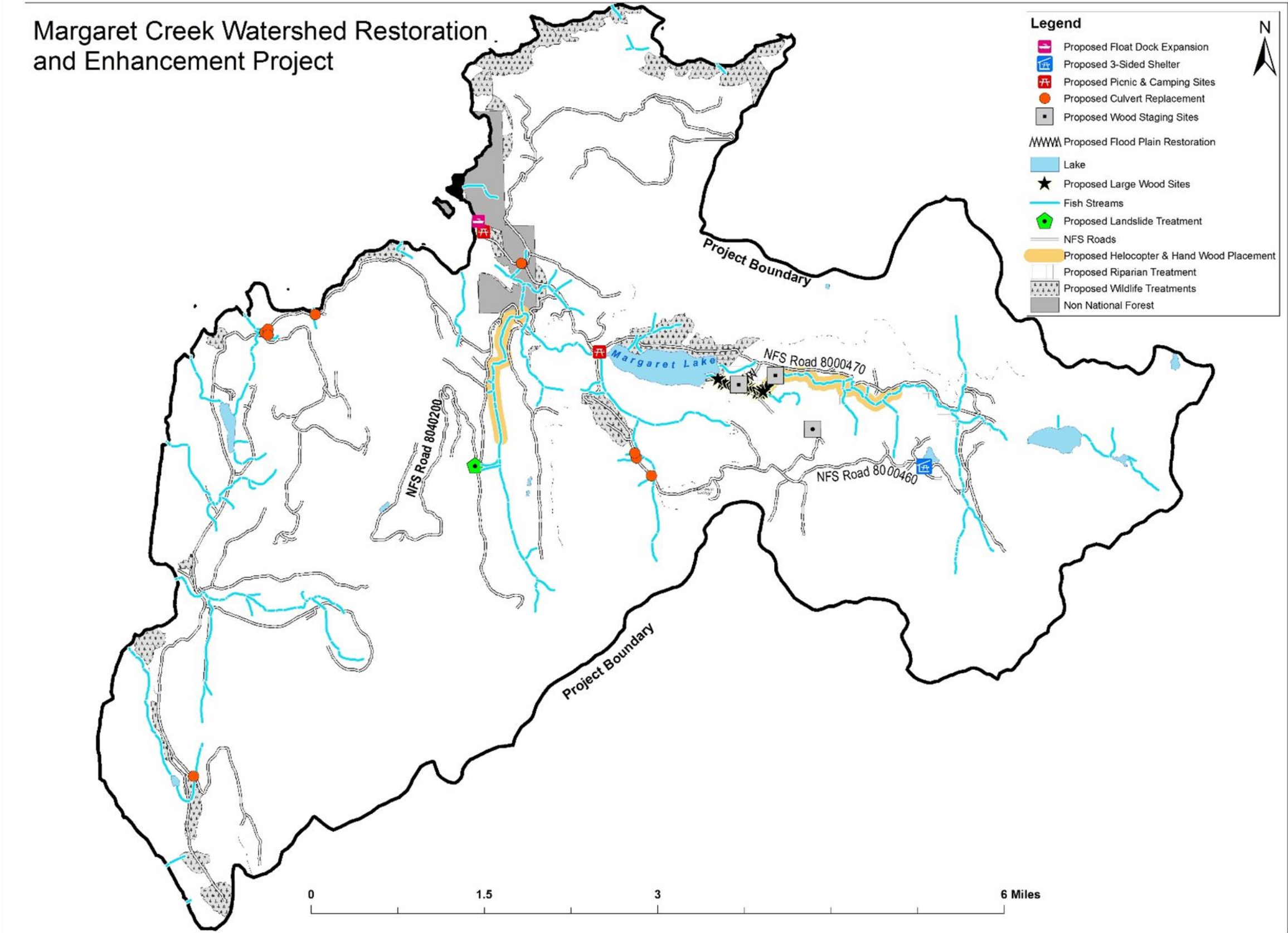


Figure 4. Alternative 2

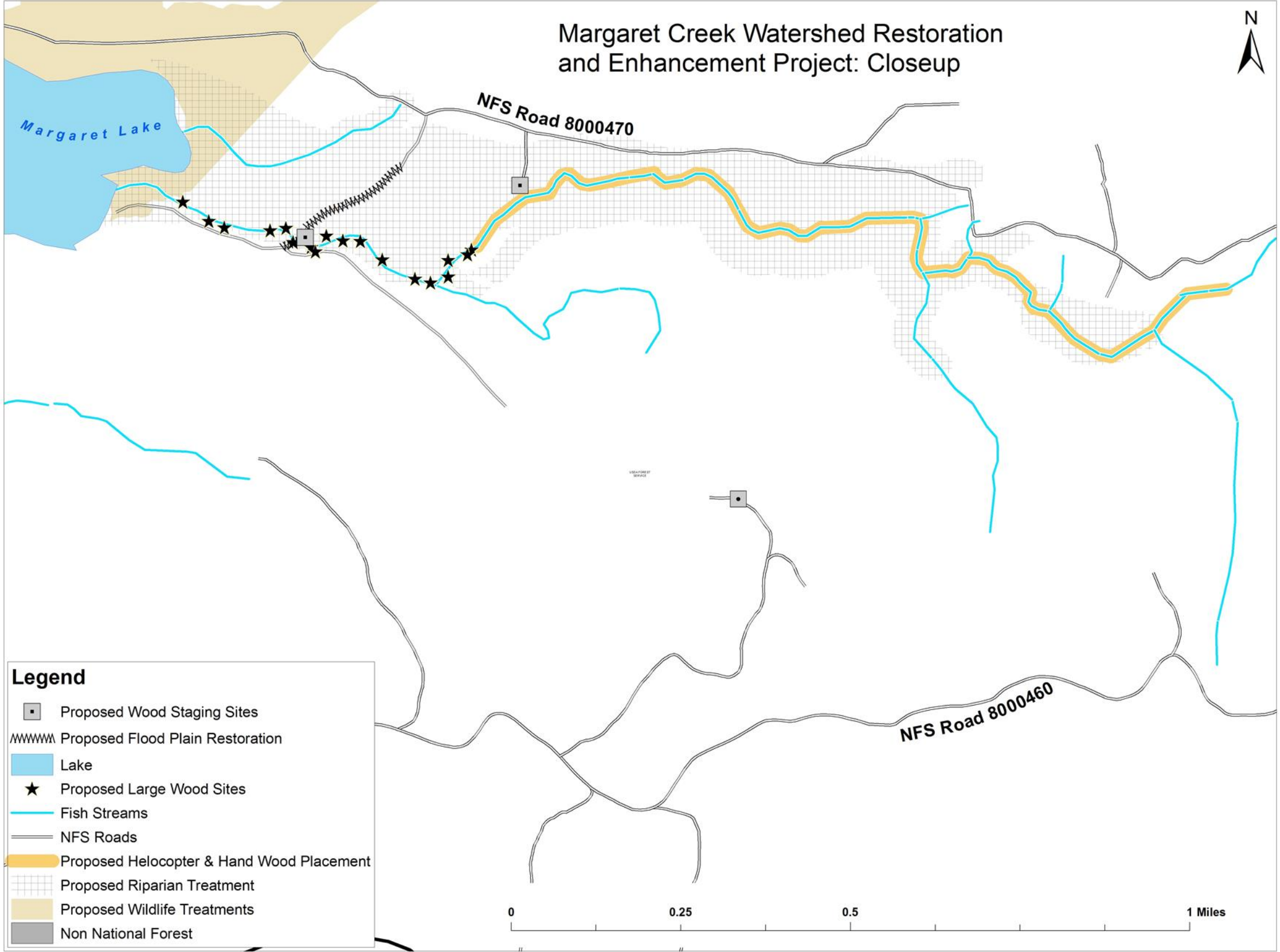


Figure 5. Alternative 2 closeup

Environmental Effects

This section describes the existing condition of the project area and discloses the anticipated direct, indirect, and cumulative impacts of the proposed activities. The information summarized in this section was obtained from published and unpublished materials; interviews with local, State, and Federal agencies; and field surveys conducted in the project area. The terms “effects” and “impacts” used in this analysis have the same meaning (40 CFR 1508.8).

For this analysis, the following terms are to be interpreted as follows:

- **Negligible:** not measureable effects that may or may not cause observable changes to natural conditions; regardless, they do not reduce the integrity of the resource. Negligible effects are when individuals would not be affected, or the action would affect an individual but the change would be so small that it would not be of any measurable or perceptible consequence to the individuals or populations.
- **Minor:** measureable but effects that cause observable and short-term changes to natural conditions, but they do not reduce the integrity of a resource.
- **No Effects / No Impact:** the proposed action will not affect listed species or critical habitat.

The project record provides a central location where information used in this analysis is filed. It will remain accessible to the public until a final decision is signed. You can request an electronic copy of the record, or you can read one of the copies at the Ketchikan Misty Fjords Ranger District.

Activities that are not present, or have no effect on a resource, are not addressed in this document. However, complete analyses for all resources are included in the project record.

Interrelated Projects

As required under NEPA and the regulations implementing NEPA, interrelated projects are considered when determining potential cumulative impacts from past, present, and reasonably foreseeable future actions when combined with the proposed action. Cumulative effect analysis areas can differ among resources, and are defined by each resource to better understand anticipated effects (40 CFR 1508.7).

Table 2 lists and summarizes past and reasonably foreseeable future actions considered in analyzing cumulative effects. More detailed information about these projects is located in the project record.

Table 2. Interrelated projects

Projects	Timing	Description
Road Maintenance	Past Action / Reasonably Foreseeable Future Action	Routine brushing, roadway reconditioning, slide cleanup, culvert replacements.
Forest Management	Past Action	Timber harvest, the main land use in the area, and associated road construction began in the Margaret Creek watershed about 1960. Clearcutting was the primary harvest practice resulting in a total of about 3,000 acres having been cut to that prescription. Of all harvested stands about 2,063 acres have been pre-commercially thinned or treated. Altogether, about 24 percent of the Margaret Creek watershed has been harvested; however, only 9 percent has occurred in the last 30 years.

Projects	Timing	Description
Margaret Wildlife Observation Site Design Narrative	Reasonably Foreseeable Future Action	Environmental analysis was completed in 2014 to replace the wildlife viewing platform. Engineering and design has not been completed. A design narrative will be developed in 2019 and implemented in 2020 or beyond.
Leftovers Pre-commercial Thinning Project	Reasonably Foreseeable Future Action	There are 229 acres of stand improvement activities (tree thinning, pruning, girdling) approved for implementation within the project area from the Leftovers Stand Improvement CE

Assumptions for Analysis

- The analysis area for direct, indirect and cumulative effects for all resources is the project area.
- Instream operations would follow Title 16 concurrence procedures with the Alaska Department of Fish and Game (ADF&G), and occur during low flow periods when fish and embryos are not present.
- Proposed activities would be scheduled to minimize impacts to outfitters and guides in the project area.
- Small-diameter alder (under 9 inches diameter at breast height) has little to no commercial value.
- Access to the Margaret Bay road system is by sea or air for the foreseeable future.

Resources or Uses Not Present or Not Affected

Resources or uses not present or not directly or indirectly impacted by the Alternatives include:

- Heritage and cultural resources
- Lands and special uses
- Scenery
- Threatened or endangered plants

Fisheries, Essential Fish Habitat and Water Quality

Alternative 1 – Proposed Action

Direct, Indirect, and Cumulative Impacts

Instream and riparian placements of large wood would have measurable, beneficial effects to fish, their habitat, and aquatic resources because the activities proposed would improve habitat. Long-term beneficial effects to Margaret Creek would be expected by storing gravels important for fish spawning, creating pools necessary for fish shelter, retaining nutrients important to fish productivity, and stabilizing stream banks. Negative impacts to the overall populations of fish from wood placement activities would be negligible because disturbance would be short in duration and sediment produced would dissipate quickly. Though individual fish may be temporarily displaced during construction and a small number may be injured or die from machinery or log placement; Forest Plan standards and guidelines, best management practices (BMPs), project design features and other measures would mitigate this. Helicopter and hand placement of instream structures would generate short-term increases in suspended sediment, albeit to a lesser extent than that created by heavy equipment.

Machines working in or adjacent to streams, especially during heavy rain events, could have minor adverse effects to fish and aquatic organisms from increased suspended sediment for short periods of time (less than 1 day) (Prussian 2007) (PR 835_0047). Potential adverse effects would be mitigated by following Forest Plan standards and guidelines, best management practices (BMPs), project design features and mitigation measures detailed in the Margaret Fish Biological Evaluation and Fish and Aquatic Project Level Analysis (PR 835_0020). Biologists would be on site during restoration activities to ensure appropriate mitigation measures are followed.

Replacing fish-blocking culverts to allow passage would have a beneficial effect in the long term by restoring access to almost a mile of stream habitat for juvenile and adult salmonids.

Obliterating the road spur within the floodplain would have a beneficial effect in the long term by returning the floodplain to natural drainage patterns, improving water quality, and restoring access to salmonids. This action would generate turbidity pulses in the immediate vicinity of the disturbance; fine particles could remain in suspension for a short distance downstream for a limited time period, dissipating with time and distance. The road spur currently stops flow through the historic channels, causing the downstream portion to be dry in all but extreme high flows, with only the upstream portion wetted during periods of normal higher flow levels. Overall long-term negative effects to fish, essential fish habitat (EFH), and the aquatic ecosystem should be negligible because best management practices, project design features, and mitigation measures would be followed.

Removing trees for restoration purposes would have negligible effects to stream temperature because trees selected would not reduce streamside shading, and specific sites would be treated for soil erosion as prescribed in Landwehr 2009.

Effects of opening NFS roads 8000460 and 8000470, and associated spur roads, for machine access and amending the Motor Vehicle Use Map to allow for off-highway vehicle use should be negligible because Forest Plan direction, best management practices, and project design features would be followed. No direct or indirect effects are expected as a result of the proposed recreation development activities.

Direct and indirect effects from herbicide application are expected to be negligible to the aquatic ecosystem, including essential fish habitat, because application is proposed only along the road prism using hand/spot spray techniques. Stream buffers have been established for the application of aminopyralid. Herbicides proposed for use are not expected to reach streams in concentrations that would harm salmonids, lead to sublethal⁴ adverse effects, or degrade water quality.

The proposed action includes activities to restore watershed function lost as a result of past timber harvest practices. No cumulative affects to the aquatic ecosystem or essential fish habitat are expected from the interrelated projects because the wildlife viewing platform reconstruction is proposed within the footprint of the existing site.

Effects to Essential Fish Habitat for All Proposed Actions

No long-term adverse effects to fish populations or essential fish habitat are anticipated from implementing any of the proposed actions because Forest Plan direction, best management practices, and

⁴ Sublethal effects can include changes in behaviors or body functions that are not directly lethal to the aquatic species, but could have consequences to reproduction, juvenile to adult survival, or other important components to health and fitness of the species. Sub lethal effects could also result from substantial changes to habitat or food supply.

project design features would be followed. For a complete analysis of this finding, see the Essential Fish Habitat Assessment (PR 835_0019).

Alternative 2

Direct, Indirect, and Cumulative Impacts

Effects to fisheries, essential fish habitat, and water quality would be identical to those listed above for Alternative 1, except where Alternative 2 differs.

Adding blasting as an Alternative method of restoring flood plain connectivity would have no adverse effects to fish, essential fish habitat, or the aquatic ecosystem because blasting would occur during periods of low flow and would follow State of Alaska Blasting Standards (PR 835_0080). Beneficial effects from restoring floodplain connectivity would be similar to those listed above in Alternative 1.

Opening the south road spur off NFS road 8000460 or log storage use would have similar effects on water quality as listed above for opening NFS road 8000470. This spur road does not cross any fish streams, so there would be no direct effects to fish or essential fish habitat, and indirect effects would be mitigated by following best management practices.

Because the 2019 Motor Vehicle Use Map for the District would not be amended or updated to allow Motor Vehicle Use Map use, effects would be similar to those listed in Alternative 1, as portions of NFS roads 8000460 and 8000470 and their spur roads would still be temporarily opened to allow machine access for the proposed instream activities. However, in Alternative 2, the road would not be left open for off-highway vehicle use when activities are completed. Therefore, those portions of the road not proposed for machine access would have no effects to fish, fish habitat, or the aquatic ecosystem because no actions would occur and existing conditions would persist.

Implementing erosion control measures on the landslide off NFS road 8040200 would have beneficial effects on the aquatic ecosystem, fish, and essential fish habitat because the proposed action would reduce erosion or sedimentation into Cobble Creek, a fish-bearing channel. Best management practices would be implemented to ensure erosion control measures taken do not harm water quality, fish, or essential fish habitat.

Treating high-priority invasive plants within riparian areas would have similar effects to the aquatic ecosystem, fish, and essential fish habitat as those listed under Alternative 1. Only aquatic formulations of glyphosate would be used, and no herbicide would be applied directly to the water column.

Alternative 2 includes additional methods and activities to restore watershed function lost as a result of past timber harvest practices. No cumulative affects to the aquatic ecosystem or essential fish habitat are expected from the interrelated projects because the wildlife viewing platform reconstruction would be within the existing site footprint.

Recreation

Alternative 1

Direct, Indirect, and Cumulative Impacts

In the short term, feelings of remoteness and solitude may be lost to forest visitors during restoration operations. There would be negligible long-term effects resulting from the collection, transport, and

placement of trees for restoration because activities would be periodic and short term, and the result would be similar to naturally occurring watershed function. An improved fishery would enhance the recreational experience in the long term as it would increase the range of recreation opportunities (e.g., recreational fishing).

Opening the closed portions of NFS roads 80000460 and 80000470 to off-highway vehicle traffic would have a beneficial effect as recreational opportunities would increase with a drivable route around Margaret Lake. Adverse effects include an increased number of off-highway vehicle users resulting in disturbance on trails and increased noises; however the overall effects are expected to be negligible due to low use and remoteness.

Temporarily opening NFS roads 8000460 and 8000470 and associated spur roads would have no effects to recreational opportunities because they would only be opened during restoration activities and would be closed when restoration is complete.

Treatments improving wildlife habitat should improve wildlife populations and overall health in the long term, which would have a beneficial effect to forest visitors.

Developing picnic sites, dispersed camping, and a three-sided shelter would have a beneficial effect because they would improve the quality of the forest experience for some visitors. If adaptive management monitoring identifies non-use or resource damage, sites developed under Alternative 1 would be closed. Closing these sites would have negligible effects.

Updated or new interpretive kiosks would have a beneficial impact to recreation since the provided information would better educate the public on natural resources in the area and possibly reduce adverse visitor impacts.

Expanding the boat dock in Margaret Bay would have beneficial impacts to floatplane and boat users by increasing the area of the dock and opportunities for moorage.

Herbicide use would have negligible effects to visitors because the site is so remote, and herbicide would be applied using only hand/spot spray techniques. There would be a minimal possibility of visitor contact with herbicide.

Cumulative effects associated with the Margaret Creek Wildlife Observation Site Enhancement Project (2014) (PR 835_0067) would affect visitors during reconstruction activities because of noise and closures, however, long-term negative cumulative effects are not expected.

Alternative 2

Direct, Indirect, and Cumulative Impacts

Effects would be identical to those listed in Alternative 1 because activities proposed would still be periodic and short term, herbicide use would occur in areas of low use, and proposed activities would increase the range of recreation opportunities. Installing outhouses would have a beneficial effect by improving the quality of restroom facilities available to forest visitors.

Silviculture and Timber Resources

The project area is a mix of old-growth and young-growth forested stands and non-forested lands. About 15,004 acres (66 percent) of the project area are forested. Old growth makes up about 62 percent (9,270

acres) of forested land, and young-growth stands, ranging in age from 19 to 61 years, make up the remaining 38 percent (5,734 acres).

Alternative 1

Direct, Indirect, and Cumulative Effects

There would be negligible direct and indirect effects to commercial and non-commercial timber in old-growth and young-growth stands from the proposed restoration activities. Wood acquisition would mimic natural wind disturbances common in Southeast Alaska and would change the light environment leading to varying levels of tree regeneration as well as an increase in understory plant and shrub growth (Nowacki and Kramer 1998) (PR 835_0065).

Thinning young-growth and riparian stands directly affects tree growth by reducing competition allowing for bigger trees to grow faster, and changes the light environment fostering new tree and plant growth (Drever 2005) (PR 835_0064). Trees treated in these stands would be non-commercial size (less than 9 inches in diameter at breast height) in lower portions of the canopy and would not adversely affect future commercial opportunities.

Timber volume removed for these activities does not represent a substantial reduction in volume available for future harvest as the volume removed is small, would focus on trees of poor timber quality, and would target less merchantable species such as hemlock.

Recreation development would have negligible effects to timber resources because the areas proposed for development would take advantage of areas already cleared for watershed restoration or located in areas not suitable for timber production.

Spot spraying of aminopyralid and glyphosate would have no direct, indirect, or cumulative effects to forest tree species since applications would occur only on the road prism. There would be beneficial effects from treating roadside invasive species because it would limit spread of invasive weeds from the road into forested areas where they would compete with native vegetation.

The Leftovers Stand Improvement project would have an overall cumulative benefit to the project area tree health and vigor; and plant and shrub diversity and longevity. No adverse cumulative effects are anticipated.

Alternative 2

Direct, Indirect, and Cumulative Effects

In addition to the effects described for Alternative 1 above, landslide restoration in Alternative 2 would benefit trees and forest vegetation by stabilizing soils, reducing erosion, and allowing soils to develop under a more natural trajectory, restoring productivity. As soils develop they will be more capable of fostering natural vegetation and tree growth and will add to suitable timber base.

Additional herbicide treatments in the riparian corridor would also benefit forest trees and natural vegetation by removing non-native vegetation that currently competes for growing space in these areas. Growing space released by killing or removing non-native plants would allow natural vegetation and trees to reoccupy these areas and maintain natural trajectory of development. No adverse effects are expected to forest trees and vegetation because non-native vegetation would be spot sprayed or mechanically removed.

All other direct, indirect, and cumulative effects are similar to Alternative 1.

Special Uses-Outfitters and Guides

Approximately 1,500 guided visitors arrive annually by boat and float plane to the Margaret Creek Wildlife Observation Site between July 15th and September 15th. A small amount of guided use, typically hunting and fishing, occurs during the fall and winter.

Alternative 1

Direct, Indirect, and Cumulative Impacts

Because restoration activities and outfitter and guide use would coincide, sights and sounds of heavy equipment and power tools could decrease the quality of visitor experience. Increased activities associated with restoration could also temporarily drive bears away from the watershed, adversely impacting the experience for guided visitors. Effects resulting from restoration activities should be negligible because work would be periodic and timed to avoid conflicting uses.

Opening NFS roads 8000460 and 80000470 could increase non-guided visitation and motorized presence, but the effects are expected to be negligible because of low use and mitigation measures.

Increasing the size of the boat dock would result in a beneficial effect to guided users since the addition would improve safety and usability of the dock.

There would be negligible effects resulting from recreational development. Some sites, such as a campsite or picnic area may be visible to a passing visitor, particularly if a site is in use, but the effects would be short term since use is low, and none of the recreation development would be visible from the Margaret Wildlife Viewing Platform.

Effects of herbicide application to guided use should be negligible because of mitigation measures.

Installing informative kiosks would have beneficial effects to guided use because they would improve the quality of visitor experience.

Cumulative effects could occur with the Margaret Creek Wildlife Observation Site Enhancement Project (2014) (PR 835_0067) which analyzed reconstruction of the existing wildlife observation site within its existing footprint. While this would affect visitors during platform reconstruction, cumulative effects with restoration activity are expected to be negligible. Long-term cumulative effects would be beneficial to outfitters and guides permitted to use the platform.

Alternative 2

Direct, Indirect, and Cumulative Impacts

Effects would be identical to those listed in Alternative 1 because activities proposed would still be periodic and timed to avoid conflicting uses, use of the area is low, and closures would be implemented where necessary. Installing outhouses would have a beneficial effect by improving the quality of restroom facilities available to the public.

Botany

One population of round-leaf orchid (*Platanthera orbiculata*), occurs within the project area. Two other sensitive species, lichen (*Ricasolina amplissima*), and Alaska rein orchid (*Piperia unalaschensis*), are suspected within the project area based upon probable habitat and known distribution (PR 835_0015, PR 835_0014, PR 835_0021). Probable habitat was determined through a review of the Regional Forester's Sensitive Species Matrix (Stensvold 2011) (PR 835_0073), knowledge of probable habitat, and aerial imagery.

Alternative 1

Direct, Indirect, and Cumulative Impacts

Direct effects associated with the harvest, transport and placement of trees may result in soil disturbance. Plants could get crushed, buried, or trampled by heavy equipment, logs or earth movement. Indirect effects include increased light reaching the soil where the canopy is opened which may result in increased vegetative growth. Stabilizing the river corridor could have beneficial indirect effects in the long-term as natural habitat is restored.

Opening and reconditioning roads would occur within the existing footprint and are unlikely to have measurable effects upon sensitive plants or their habitat.

Increased traffic resulting from converting NFS roads 8000460 and 8000470 to off-highway vehicle trails could increase the introduction and spread of invasive species which would compete with native plants; however, effects would be negligible because roadside invasive species will be treated.

Establishing picnic areas and dispersed camping sites along Margaret Lake could have minor direct effects to sensitive plants or their habitat through trampling, crushing, burying and changing habitat; however, the footprint would be small. Indirectly, the increased recreation use increases the risk of introducing or spreading invasive plants. However, this is expected to be minor because use is anticipated to remain low and roadside invasive species will be treated.

Treating invasive species may directly impact sensitive plants or their habitat. Hand-pulling would have negligible direct effects as there is minimal soil disturbance. Direct effects of glyphosate and aminopyralid could include damaging or killing non-target plants where interspersed. Because treatments are proposed along the road shoulder only, which is not likely habitat for sensitive plants, the effects are negligible. Indirectly, herbicide drift may damage nearby non-target vegetation (SERA 2003) (PR 835_0051). Project design features and adjusted spray drop size would minimize negative indirect effects. Overall, controlling invasive plant infestations will have a positive indirect effect on sensitive plant habitat. Because treatments are proposed along the road, which is not likely habitat for sensitive plants, and all project design features will be followed, the direct and indirect effects are negligible.

Riparian thinning activities would have negligible direct and indirect effects to sensitive species because these effects are short term, and have beneficial impacts to sensitive plant habitat by opening the canopy and decreasing tree density.

No cumulative effects are expected because field surveys would ensure that no sensitive plants occur at new picnic or dispersed camping sites. There would be negligible to no cumulative effects because there are negligible direct or indirect effects, and beneficial effects, from all other activities.

Alternative 2

Direct, Indirect, and Cumulative Impacts

The effects for Alternative 1 are the same as Alternative 2 with the following exceptions.

Blasting to restore flood plain connectivity would have the direct effect of uprooting, burying and crushing plants as well as disturbing soils. Indirect effects could include small changes in habitat with exposed mineral soil, increased light and potential changes in humidity. In the long-term, the restored connectivity would restore natural habitat which is beneficial for sensitive plants. Direct effects would be minor; however, over the long-term the indirect effects are expected to have a positive impact.

The proposed landslide restoration activity would have no adverse direct or indirect effects to sensitive plant species with implementation of the *Erosion Control on the Tongass* guidelines (Landwehr et al. 2018).

There could be minor direct effects from the proposed treatments of reed canarygrass in riparian areas because treatments could damage or kill non-target plant species. Indirect effects would be negligible because treatments could include non-target plant damage due to drift. There would be beneficial indirect effects to sensitive plants by removing the invasive species.

There would be negligible to no cumulative effects to plants from actions proposed in Alternative 2 from past, present, and future activities because there are either negligible to no direct or indirect effects, or expected beneficial impacts.

Invasive Plants

There are five known invasive plant species documented within the project area: oxeye daisy, foxglove, common St. Johnswort, hairy cat's ear, and reed canarygrass (PR 835_0014). Reed canarygrass is the species of primary concern as this plant spreads along stream banks and lake shores. During surveys conducted in August of 2017, reed canarygrass infestations were found along Margaret Creek above the lake, as well as on the lake shore near the inlet.

Alternative 1

Direct, Indirect, and Cumulative Impacts

The proposed restoration activities within the stream channel would have the direct effect of moving and exposing soil during excavation and log placement, as well as potentially spreading reed canarygrass present within the riparian corridor. Invasive plants could establish within the project area as a result of open travel corridors, root-wad removal, tree removal, and increased light availability. Non-native plant species could establish and out-compete native plants for preferred habitat. Direct effects are expected to be minor because of implementing project design features. There would be minor indirect effects from removing trees for restoration because there may be changes to water availability.

Direct and indirect effects from ground disturbance and increased person and vehicle traffic associated with the three-sided shelter, dispersed campsites along the lake, and installation of kiosks would be minor because implementation could introduce unwanted seeds, expose soil and open the understory to light.

Opening up the road to off-highway vehicle use could introduce more vehicular traffic that may carry invasive seed or viable plant parts. The direct effect to invasive species from opening NFS roads 8000460 and 8000470 would be minor, as opening up the canopy over the road corridor would increase light on the

soil surface and improve growing conditions, potentially allowing invasive plants to spread in the short term. As the forest canopy closes in, the infestations are expected to be shaded out so the indirect effects are expected to be negligible.

The cumulative effects would be negligible for all activities adjacent to the road because treatments controlling current invasive plant infestations along the road corridor and implementation of project design features would prevent the introduction of new invasive plants. The cumulative effect of the riparian restoration work is minor in the short term given the soil disturbance and increased traffic. Efforts made to minimize both soil disturbance and contact with areas infested by reed canarygrass would mitigate the likelihood of spread. In the long term, the cumulative effects of the restoration activities are negligible but beneficial due to the effects to the riparian corridor.

Alternative 2

Direct, Indirect, and Cumulative Impacts

The analysis for Alternative 1 applies to Alternative 2, with the following additions:

Removing the proposal in Alternative 1 to modify the Motor Vehicle Use Map to open NFS roads 8000460 and 8000470 for off-highway vehicle use would reduce the likelihood of introducing or spreading invasive species, which would be a beneficial effect.

Blasting has the direct effect of increasing disturbed sites open for establishment by invasive species as well as spreading invasive plants if present. As a result, direct effects are expected to be minor. Over the long term, the culvert and floodplain connectivity work should decrease the likelihood of establishment or spread of invasive species as natural habitat is restored, which is a beneficial indirect effect.

The proposed landslide restoration activity would have no adverse direct or indirect effects to invasive plant species with implementation of the *Erosion Control on the Tongass* guidelines (Landwehr, et al. 2018). Treating reed canarygrass within the riparian corridor would have positive direct and indirect effects, as controlling this species ahead of restoration activities will decrease the likelihood of spreading the plant along the river channel as well as begin to control the existing infestation.

As with Alternative 1, cumulative effects would be negligible. Even with potential minor direct effects, such as with blasting, in the long term, the cumulative effects of the restoration activities would be negligible but beneficial due to restoring the riparian corridor.

Wildlife

Alternative 1

Direct, Indirect, and Cumulative Impacts

Effects from instream wood placement would be negligible. There would be short-term disturbance to riparian-dependent wildlife species such as beavers, mink, river otters, dippers, kingfishers, and others from the instream wood placement. However, adverse effects would only be expected during project implementation, and long-term effects from improved stream habitat would be beneficial.

Wood acquisition would have minor direct and indirect effects to wildlife. However, potential effects would be minimal because of the small scope and scale relative to the project area. There would be a

reduction of up to 13 acres of old-growth habitat in separate one-half acre openings distributed through the project area.

Species and nests directly in the path of the punchon trails may be affected during construction, but only individuals would be affected, and long-term or measurable effects to any potentially affected species would not be expected. All potential effects would be negligible. The negligible direct and indirect effects from this proposed action would not measurably contribute to any cumulative effects.

The proposed action may impact individuals but is not likely to cause a trend to federal listing or a loss of viability for Queen Charlotte goshawk, a Region 10 sensitive species. The District wildlife biologist would be present during tree selection for wood acquisition to assess trees for goshawk nests.

Opening the closed portions of existing NFS roads 8000460 and 8000470 may disturb wildlife in the immediate vicinity during the reconstruction of the roads and the implementation of the stream restoration activities. Updating the Motor Vehicle Use Management plan could have short-term adverse effects to wildlife from increased disturbance and harvest opportunities for game species; however, it is unlikely to have measurable long-term direct or indirect effects to wildlife beyond the road system due to the remoteness of the site. The proposed action would increase the open road density in the project area, although it is unlikely that it would increase the amount of traffic because of the remoteness of the area. Hunting and trapping pressure in the project area is low; therefore, impacts to wildlife, including game species, from the update to the Motor Vehicle Use Management plan would be negligible. Alaska Department of Fish and Game biologists have no concerns for wolf harvest in that area (Porter 2018 Pers Comm) (PR 835_0041).

The proposed wildlife habitat improvement treatments could have negligible direct and indirect effects to wildlife. Slash produced from proposed treatments could have short-term adverse effects to deer movements; however, proposed mitigations would prevent slash loading on wildlife travel corridors. The proposed treatments would also have long-term beneficial effects to deer from increasing preferred browse species and accelerating succession towards old-growth characteristics. The presence of people working and noise from proposed wildlife habitat improvement activities would likely disturb and potentially displace wildlife during operations. Individual birds (or other wildlife) nesting or otherwise utilizing trees that are thinned could be directly affected. However, these effects would be limited to the individuals affected, and would not affect the viability of populations throughout the project area.

Constructing a three-sided shelter, developing picnic areas, and creating dispersed camping sites could result in some minor, short-term disturbance to wildlife during construction, but long-term effects would likely be negligible. Following Forest Plan direction for recreation facilities and enhancing public education at the proposed kiosks would keep direct and indirect effects to a negligible level.

Installing new and enhancing existing interpretative kiosks along trails and roads could result in minor short-term disturbance to wildlife from the noise of drills or other power tools as well as the presence of people, but would be negligible due to the minimal noise level and the short timeframe required for construction. Pertinent and important education information provided on the kiosks could have minor long-term benefits to wildlife both at the site and elsewhere on the forest by better educating forest users. The negligible direct and indirect effects would not contribute to any cumulative effects in the project area.

Reducing, containing, or eliminating populations of invasive species on the Margaret Creek road system could have short- and long-term beneficial effects for some wildlife species that are adversely impacted by invasive plant infestations. Chemical treatments could have adverse impacts to wildlife with the

greatest potential effects to small birds (less than 10g) that consume vegetation. Considering the low probability of exposure and low toxic properties of the herbicides proposed for use, the conservative application techniques proposed, and the small scope and scale of the proposed action, the effects to most wildlife would at most be negligible. Effects to migratory birds from proposed herbicide use would be expected to be minor at most, considering the potential short-term risks to individuals.

There would be no direct and indirect effects to wildlife beyond a no effect or negligible determination, with the exception of a “May impact individuals but not likely to cause a trend to federal listing or a loss of viability” determination for Queen Charlotte goshawk, and a “minor” level of influence determination for migratory birds. Therefore, with the exception of Queen Charlotte goshawk and migratory birds, there would be no cumulative effects to wildlife because there would be negligible to no direct or indirect effects.

Although there could be potential adverse effects to individual Queen Charlotte goshawks, the mitigation measures, as well as Forest Plan standards and guidelines would reduce the likelihood of those potential effects. Effects from the proposed action would not likely contribute to cumulative effects of past, present, and reasonably foreseeable actions. The proposed project is of a small scope, scale, and duration, so it would not likely contribute to cumulative effects. Past timber harvest has occurred on approximately 24 percent of the Margaret Creek watershed, which has likely reduced some suitable goshawk nesting habitat as well as goshawk prey habitat. The proposed action would at most remove trees from a maximum of 13 acres in separate half-acre openings near roads throughout the 22,874-acre project area, which is a small scale relative to the size of the project area, and the size of the historic harvest, therefore would not contribute to cumulative effects. Implementation of the Leftovers Pre-commercial Thinning Project is unlikely to contribute to cumulative effects to goshawks since it is taking place in young, pre-commercial stands.

The potential effects of the proposed actions, including large wood acquisition, punchon road construction, and herbicide use to migratory birds would be expected to at most be minor, considering the potential short-term risks to individuals. Since there would be potential for some minor direct and indirect effects to migratory birds from the proposed project, cumulative effects would be possible. However, because of the small scope, scale, and duration of these proposed treatments relative to the project area size, the proposed action does not contribute to cumulative effects from past, present or reasonably foreseeable activities.

Alternative 2

Direct, Indirect, and Cumulative Impacts

Most of the potential effects to wildlife are the same in Alternative 2 as they are in Alternative 1; therefore, to avoid redundancy this portion of the Effects and Determinations will focus on how the potential effects of Alternative 2 differ from Alternative 1. The level of influence/determinations for Alternative 2 are the same as Alternative 1; however, the reason for some of the determinations may be slightly different. All effects will be the same in Alternative 2 as Alternative 1, except those discussed below.

Opening the additional spur roads off of the NFS road 8000460 to allow staging of trees and logs designated for helicopter placement (Figures 4 and 5) would likely have no additional effects from Alternative 1; however, the historic goshawk nests last documenting use in the 1990s are about half a mile and less than 2 miles from the road spur. Since the use of a helicopter would likely be done during the nesting or fledging season, there could be impacts to individual goshawks. However, since the use of a

helicopter would be short in duration, those impacts would not cause a trend towards federal listing or a loss of viability in the project area. The anticipated direct and indirect effects from this proposed action to individual goshawks would not contribute to any cumulative effects.

The use of blasting as an additional method to restore flood plain connectivity and remove additional culverts could disturb or temporarily displace wildlife. However, it would be limited to road corridors and be of short duration. Because of the small scope, scale, and duration, the impacts to wildlife from blasting would be negligible, and subsequently would not contribute to any cumulative effects.

Landslide Restoration- Erosion control measures on NFS road 8040200 (Figure 4) using methods such as seeding, catchment basin construction, and drainage relief to clear culverts and ditches could cause some temporary negligible disturbance to wildlife from the use of heavy equipment and presence of crews.

Not Updating Motor Vehicle Use Map- The proposed update to the Motor Vehicle Use Map (MVUM) is not proposed as part of Alternative 2; therefore, the effects of that proposed action analyzed in Alternative 1 would not be part of the Alternative 2 analysis and effects determinations.

Toilet Replacement- Removing existing outhouses and installing new vault toilet outhouses at the Margaret Wildlife Viewing trailhead and at the administrative cabin site would have no direct or indirect effects beyond potential disturbance to wildlife during the construction. Wildlife, especially birds, can become entrapped in outhouses; therefore, installing screens on outhouse vents is recommended to reduce the potential of entrapment in outhouses. There could be some negligible beneficial effects using more modern vault toilets instead of the current outhouse.

Treating high-priority invasive plants (PR 835_0085) within riparian corridors of Margaret Creek using herbicide and mechanical methods, increases the potentially affected area compared to Alternative 1. However, the overall scale relative to the project area is anticipated to be negligibly small; therefore, the level of influence is minor as it is in Alternative 1.

Overall, cumulative effects for Alternative 2 are anticipated to be the same as Alternative 1.

Subsistence

Alternative 1

Direct, Indirect, and Cumulative Impacts

Consistent with section 810 of the Alaska National Interest Lands Conservation Act (ANILCA), this project evaluated potential effects on subsistence opportunities and resources. The proposed action would not reduce access or increase competition, nor change abundance or distribution of subsistence resources in the project area. The proposed action would have a beneficial effect to access and competition because the proposed action would open the existing road (NFS road 8000470) along the north shore of Margaret Lake for machine access during restoration activities, and upon completion of restoration activities convert NFS road 8000470 to an off-highway vehicle trail instead of returning to closed status. In addition, the proposed action proposes to open the 0.25 mile of the closed portion of NFS road 8000460 and converting to off-highway vehicle trail loop, connecting to NFS road 8000470. The majority of NFS road 8000460 is currently already opened to vehicle traffic and receives very low use.

Although the proposed action would improve upon access to the upper Margaret Lake area in the long term to subsistence users by converting NFS road 8000470 to off-highway vehicles, use is not expected to change substantially due to the remoteness of the area. The proposed activities would not result in a

significant possibility of a significant restriction of subsistence use of wildlife, fish, or other foods. The proposed action would not result in a significant change or restriction of access to subsistence resources. Therefore, there would not be any negative direct or indirect effects on the access to, and competition for, subsistence resources. Since there are no negative direct and indirect effects, there would be no cumulative effects to subsistence resources.

Alternative 2

Direct, Indirect, and Cumulative Impacts

Consistent with section 810 of the Alaska National Interest Lands Conservation Act (ANILCA), this project evaluated potential effects on subsistence opportunities and resources. Alternative 2 would not reduce access or increase competition, nor change abundance or distribution of subsistence resources in the project area.

Although Alternative 2 removes the proposal to amend the Motor Vehicle Use Map and allow off-highway vehicle use on NFS road 8000470, use is not expected to change substantially due to the remoteness of the area, and existing conditions would not change. Like Alternative 1, the proposed activities would not result in a significant possibility of a significant restriction of subsistence use of wildlife, fish, or other foods. Alternative 2 would not result in a significant change or restriction of access to subsistence resources. Therefore, there would not be any negative direct or indirect effects on the access to, and competition for subsistence resources. Since there are no negative direct and indirect effects, there would be no cumulative effects to subsistence resources.

Soils

Soils in the project area are typically less than 3 feet thick over bedrock, and there are no calcium carbonate soils or karst. Deeper soils underlain by dense till occur in concave areas at low elevations in the project area. Past activities, including timber harvest and road construction have affected some soils on the project area.

Landslides continue to occur in the watershed on a small scale; the last large-scale landslide event in the watershed was a spring 1999 rain-on-snow event that produced 14 landslides and turned Margaret Lake brown (Gier 2000) (PR 835_0004). Currently, most landslides have established vegetation cover and soils are recovering. One non-vegetated landslide exists near the switchback on NFS road 8040200. This slide occurred between 2006 and 2015 and is just over 4 acres in size.

Timber harvest and road construction has destabilized the floodplain soils at the head of Margaret Lake. The unstable floodplain soils typically support red alder-dominated stands. Road construction has limited stream access to the floodplain and overflow channels, thus disrupting the ability of the floodplain soils to receive and store nutrient-rich flood-borne sediments, and affecting soil productivity and floodplain function.

Alternative 1

Direct, Indirect, and Cumulative Impacts

Rootwad collection has the potential to severely affect the soil resource by removing topsoil with the rootwad; however, collection would be discontinuous and spread over a large area along existing roads resulting in negligible effects. Obliteration of the road spur, when combined with the instream wood placement, would help restore stream access to the floodplain and natural flood sediment deposition and

soil function. Road fill removed from the floodplain or floodplain channels would be placed atop adjacent upland road surfaces. In Alternative 2 where blasting may be used to remove the road prism in floodplain channels, the shot rock would be distributed across local soils.

The primary effects of road construction/modification and culvert replacement include increased soil erosion, changes to soil productivity and lack of soil stability on large woody dependent stream channels and landforms. Heavy equipment would create access trails from existing road prisms to the stream channel. Punchon trails would prevent soil compaction and disturbance. Soil quality monitoring of access trails (Landwehr and Foss 2014) (PR 935_0071) has shown that access trails constructed and decommissioned as described in the proposed action would have negligible effects on soil quality.

Invasive plants would be addressed with a combination of treatments including hand pulling, tarping, and herbicide use. Based on the analysis of weed treatment methods discussed in Krosse 2018 (PR 835_0021), hand pulling and tarping may have negligible to minor effects on soil erosion and soil fauna. Under the manufacturer's recommended dosage, herbicide use would also have negligible effects on soil fauna. In no case is soil productivity expected to be affected by one or multiple applications of herbicide used to treat invasive plants. In Alternative 2 where herbicide is also proposed for use on riparian soils, negligible effects to soils are expected because the herbicide proposed is approved for use in the aquatic environment.

Converting roads to off-highway vehicle trails may increase erosion from the road/trail surface, but soils would not be affected as road surfaces on the project area consist of shot rock.

Past, present and reasonable foreseeable future activities, including timber harvest and road construction have affected some soils on the project area. Other foreseeable actions include potential for road maintenance work, pre-commercial thinning of young-growth stands, and reconstruction of the wildlife viewing platform. All of these activities would have a negligible effect on the soils resource.

In young-growth stands, existing detrimental soil conditions from past harvest activities may exist. There is the potential for the existing detrimental soil conditions when combined with the soil conditions resulting from activities proposed under Alternatives 1 and 2 to exceed the 15 percent threshold for detrimental soil conditions in the Region 10 soil quality standards. Where ground-disturbing activities are proposed in existing young-growth stands, an assessment of existing detrimental soil conditions would occur, and areas potentially exceeding soil quality standards would be avoided. Following this guideline will result in negligible to minor effects on the soil in rootwad collection areas. Minor positive effects to the floodplain soils will occur as a result of road removal on the floodplain and instream restoration that restores floodplain connectivity. Foreseeable actions include potential for road maintenance work, pre-commercial thinning of young-growth stands, and reconstruction of the wildlife viewing platform. All of these activities would have a negligible effect on the soils resource.

Alternative 2

Direct, Indirect, and Cumulative Impacts

Alternative 2 differs from Alternative 1 in that roads would not be converted to an off-highway vehicle trail; thus some road erosion potential would be avoided. Alternative 2 also includes treating weeds in the riparian zone; however, only herbicides approved for aquatic use would be used, resulting in negligible effects to riparian soils. Alternative 2 reopens a road on the south side of the lake for log storage. Soils would not be affected as the footprint of the disturbance would be on the road. Because blasting would

only occur in the road prism, it would have a negligible effect on surrounding soils, including minor deposition of blasted material on soils adjacent to the road prism.

Wetlands

There are about 8,780 acres of wetlands and about 53 miles of road in the project area. About 11.5 miles of existing road go through wetland areas which equates to about 56 acres of wetland loss. About 5,904 acres of timber harvest has occurred on the project area and about 536 acres were on wetland areas.

Alternative 1

Direct, Indirect, and Cumulative Impacts

Under the proposed action, a small amount of timber harvest (log only harvest) may occur along roads in forested wetland areas. Typically this activity results very small areas of soil disturbance. No loss of wetlands are expected from this activity and effects of log-only collection are expected to be a temporary increase in soil moisture levels. No stream restoration sites or access trails for stream restoration are planned in wetland areas. Rock material removed from the road on the floodplain would be placed in upland areas. The only other activity that may occur in wetlands is the kiosk placement at the trailhead to the bear viewing platform, and effects to wetlands from the kiosk would be negligible.

Because best management practices and the 15 federal baseline provisions described in Forest Service Handbook 2509.22 (PR 835_0007) would be followed, cumulative effects to the wetlands resource are expected to be negligible.

Alternative 2

Direct, Indirect, and Cumulative Impacts

Herbicides approved for aquatic use would be used in wetland areas along roads and along a one-half mile section of Margaret Creek, and all label instructions would be followed. Based on the analysis contained in Krosse 2018 (PR 835_0021), the effects of herbicide use on wetland function and the aquatic environment would be negligible.

Agencies and Persons Consulted

Federal, State, and Local Agencies

USDA Forest Service

National Oceanic and Atmospheric
Administration, National Marine Fisheries
Service

State of Alaska Department of Fish and Game

Federally-Recognized Tribes

Organized Village of Saxman

Ketchikan Indian Community

Metlakatla Indian Community

Others

Cape Fox Native Corporation

Alaska Native Brotherhood Camp 14

Ketchikan High School Youth Advisory Council

Finding of No Significant Impact

As the responsible official, I am responsible for evaluating the effects of the project relative to the definition of significance established by the Council on Environmental Quality (CEQ) regulations (40 CFR 1508.13). I have reviewed and considered the Environmental Analysis and documentation included in the project record, and have determined that Alternative 2 will not have a significant effect on the quality of the human environment. As a result, no environmental impact statement will be prepared. My rationale for this finding is as follows, organized by sub-section of the CEQ definition of significance cited above.

Context

For the selected actions, the context of the environmental effects is based on the analysis in this EA (40 CFR 1508.27(a)). The relevant effects addressed in this EA are defined for the analysis areas for each resource at an appropriate scale for the proposed action and Alternative. All activities described in this EA are consistent with applicable Forest Plan direction. Actions described in the Alternatives (EA, pp. 3-8) are similar to other projects that have occurred or are occurring on the Tongass National Forest.

Even in a local context, Alternative 2 would not pose significant short- or long-term adverse effects. Forest Plan direction and design criteria mitigate adverse impacts to the extent that impacts to some resources are negligible. (Table 1, and Environmental Effects section.)

Intensity

Intensity is a measure of the severity, extent, or quantity of effects, and is based on information from the effects analysis in this EA and the documentation in the project record. The effects of this project have been thoroughly considered with an analysis that is responsive to comments and concerns raised internally, and externally by the public. Field visits have provided relevant scientific information and knowledge of site-specific conditions to aid in the identification of environmental effects. The finding of no significant impact is based on the context of the project, and intensity of effects using the ten factors identified in 40 CFR 1508.27(b).

1. *Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.*

- Effects of Alternative 2 were analyzed and disclosed by resource specialists at spatial and temporal scales appropriate to that resource in this EA (pp. 13-28). Potential adverse impacts of the actions proposed are either avoided in space and time or are mitigated through project design including best management practices and applicable Forest Plan direction. (See Environmental Effects section and Table 1). Some effects are negligible because they are of limited size and/or duration.
- Neither adverse nor beneficial effects are significant in context or intensity to warrant an EIS for this project. My finding of no significant environmental effects is not biased by the beneficial effects of the action.

2. *The degree to which the Proposed Action affects public health or safety.*

- Activities associated with habitat enhancement and recreation development have been implemented on the Forest with no impacts to public health or safety. No circumstances or conditions exist to indicate unusual or substantial risks to public health and safety. No concerns were raised during the

public scoping period. Contract measures will be enforced during implementation to minimize conflicts with outfitter guides (Table 1).

- Based on the conclusions in the EA, I have determined that no significant impact would occur to the public health and safety, although project operations could have minimal and short-term adverse effects on recreational users of the area during the time activities occur, which would be mitigated (Table 1).

3. *Unique characteristics of the geographic area such as the proximity to historical or cultural resources, parklands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.*

- There would be no significant effects on unique characteristics of the area, because the project does not enter into any inventoried roadless areas. Additionally, no historic properties, park lands or farmlands are located with the area of potential effects for the project. No designated wild and scenic rivers or recreational rivers occur in the project area or are affected by the project. The actions proposed would not affect the eligibility of any segments recommended for either wild and scenic river system or recreational river designation, and no high-value wetlands will be affected by the project. Therefore, I have determined there would be no significant effects on any unique characteristics of the area.

4. *The degree to which the effects on the quality of the human environment are likely to be highly controversial.*

- I have reviewed all comments received during the scoping comment period for the proposed project, the analysis documented in the EA, and the information in the project record. Based on the level of public outreach, the limited and localized response, and the lack of scientific controversy over the impacts of this project, I have determined that it is unlikely the effects to the human environment from implementing Alternative 2 would be highly controversial.
- Commenters provided support for various elements of the project, or the project in its entirety. These are documented in the project record.
- The effects on the quality of the human environment are not likely to be highly controversial. There is no known credible scientific controversy over the impacts disclosed in Alternative 2. While there is general controversy over old-growth timber harvest in Southeast Alaska, this project proposes to remove lesser-value and/or defective old-growth trees for the purpose of improving stream habitat. This project responds to the goals and objectives of the Forest Plan, and advances the project area towards desired conditions described in the Margaret Integrated Resource Management Plan (PR 835_0029) and the Margaret Watershed Restoration Action Plan (PR 835_0018). Therefore, I have determined that there are no significant impacts based on the evidence found in the EA that would be highly controversial.

5. *The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.*

- Watershed enhancement, recreation development, and road reconditioning activities have occurred on the Tongass National Forest. Forest Service personnel have considerable experience with the types of activities described in Alternative 2, which are reasonably predictable and well understood. None of the activities proposed are new or unique. Based on the analysis, I believe the possible effects on the human environment are not highly uncertain and do not involve unique or unknown risks. The analysis disclosed in the EA (pp. 13-28), supports my conclusion. Based on this analysis,

I have determined there are no unique or unknown risks involved with this project, therefore there is no significant impact due to uncertainty or a possible unique or unknown risk.

6. *The degree to which the action may establish precedent for future actions with significant effects or represents a decision in principle about a future consideration.*

- The activities proposed in the EA are well-established practices on the Tongass National Forest and do not establish a precedent for future actions. Alternative 2 is not likely to establish precedent for future actions with significant effects because this type of action has occurred in the past. The actions proposed in the EA would take place on previously managed ground, and use an already established road system (Figure 1) and are, therefore, similar in size and scope of past actions. The effects of Alternative 2 were considered by the interdisciplinary team within the context of past, present, and reasonably foreseeable future actions. (See the cumulative effects analysis for all resources in the Environmental Effects section of the EA, beginning on page 13).

7. *Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.*

- I have determined the actions proposed in Alternative 2 will have individually insignificant impacts and cumulatively insignificant impacts as they relate to past, present, and reasonably foreseeable actions. No significant cumulative effects were identified for any resource in the EA (see Environmental Effects beginning on page 13). Stream and floodplain habitat improvements should have long-term beneficial effects to project area aquatic and riparian habitats and aquatic organisms.

8. *The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.*

- I have determined that a finding of No Historic Properties Affected is appropriate for this project. The project meets the provisions stipulated in the Programmatic Agreement between the Forest Service, Alaska Region, the Advisory Council on Historic Preservation, and the State Historic Preservation Officer. Therefore, I have determined no significant impacts would occur that adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or cause loss or destruction of significant scientific, cultural, or historical resources.

9. *The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.*

- There are no threatened or endangered plant species on the Tongass National Forest (Forest Plan FEIS, pp. 3-146). Potential effects to all federally threatened and endangered wildlife species, candidate species and habitat that could occur in the project area were analyzed as part of the Fish, and Wildlife Biological Evaluations (BE) for this project (PR 835_0016 and 835_0020). Direct,

indirect, and cumulative impacts are disclosed in the fish and wildlife effects analysis. I have determined that the actions proposed would not result in significant effects (EA, pp. 22).

- Findings in the BE conclude that potential effects to species analyzed would range from minor to negligible and/or have no effect (BE, pp. 16-31).

10. Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

- The action does not violate any Federal, State, or local law or requirements imposed for protection of the environment. The analysis and implementation complies with all applicable Federal, State, and local laws and regulations, and is consistent with policy pertaining to management of National Forest resources. The proposed action and alternative follow best management practices and includes other mitigations to avoid, minimize, and protect the environment (Table 1).

Appendix: Project Design Features

Herbicide Use

1. Prior to initiating any treatment using herbicides, surveys for sensitive plants will be conducted if suitable sensitive plant habitat is in or near an infestation.
2. A 100-foot buffer around sensitive plant populations will be placed if using broadcast methods.
3. Between 60 and 100 feet from a sensitive plant population only hand application (wicking/wiping, or stem injection). However the District Ranger may allow use of herbicides within 60 feet of a sensitive occurrence (per Forest Plan components) if deemed necessary to control an infestation that may pose a threat to that occurrence.
4. To reduce potential spray drift or run-off, herbicides will not be applied when average wind speeds exceed the maximum wind speed stated in the product labeling (10 mph), or seven miles per hour if no maximum wind speed is stated in the labeling.
5. Herbicide treatments will be scheduled as practicable to reduce adverse impacts to nearby sensitive plants. For example, herbicides should be applied to an infestation of a late-growing weed species after sensitive or rare plants in the vicinity have entered dormancy, to minimize potential impacts due to spray drift or run-off.
6. Herbicides will not be applied immediately prior to, during, or immediately after a rain event at the treatment site to prevent pesticide runoff into adjacent water bodies and saturated soils or loss of pesticide penetration. Sufficient time will be allowed for the herbicide product being applied to dry before a rain event, and for visible surface run-off from a rain event to cease before applying herbicide.
7. Prior to treatment, weed specialist would confirm species/habitats of local interest or concern, watershed and aquatic resources of concern (e.g., hydric soils, streams, lakes, roadside treatment areas with higher potential to deliver herbicide, municipal watersheds, domestic water sources), and nearby places where public use is known, such as recreation sites. (BMP 15.5, Chem-1)
 - a. Forest Service personnel will identify riparian areas according to methods outlined in the Tongass Riparian Management Area standards and guidelines prior to implementation of herbicide application. Forest Service specialists will work closely with herbicide applicators to ensure project design features are implemented.
8. Hand crews will stay out of flowing or ponded water whenever possible.
9. Herbicide usage will be limited to minimum amount required to be effective.
10. If foliar/spot spraying application is required, the following techniques will be used to minimize drift (BMP 15.2, Chem-2)
 - a. Label directions regarding wind speed and temperature will be followed.
 - b. Within riparian management areas, herbicides will only be sprayed in a downward direction.
11. Buffers / Spray Distance to Water (BMP 14.6, Chem-3)
 - a. Minimum distance to water is 10 feet for applying aminopyralid with either spot-spray or hand/select methods (Table 1). Aquatic versions of glyphosate can be applied to water's edge with both spot-spray and hand/select application methods (Table 1).

- b. In the marine environment, herbicides can be applied above the mean high tide line during low/outgoing tides with spot-spray and hand/select methods.
- c. Begin application of herbicide products nearest to the aquatic habitat boundary and proceed away from the aquatic habitat; do not apply towards a water body.

Table 3. Buffers and application methods for riparian vegetation

Herbicide	Spot (Feet)	Hand/Select (Feet)
Aminopyralid	10	10
Glyphosate (Aquatic formula**)	None	None

**When combined with surfactants, POEA will not be utilized.

- 12. Herbicide will not be applied to more than 10 acres along any single stream or riparian infestation per year.
- 13. Apply erosion control measures (e.g. silt fences or shut down periods) and native revegetation (e.g., mulching, native grass seeding, planting) for manual treatment where detrimental soil disturbance or de-vegetation may result in the delivery of measurable levels of fine sediment. (BMP 12.17, Veg-2)
- 14. Pest Management Plan (BMP 15.2, Chem-2, Chem-3)
 - a. If pesticides must be applied, consider area, terrain, weather, droplet size, herbicide characteristics, and other conditions to avoid or reduce effects to aquatic organisms. Follow all label directions.
- 15. Weather Conditions (BMP Chem-3)
 - a. Consider current and recent meteorological conditions. Rain events may increase pesticide runoff into adjacent water bodies. Saturated soils may inhibit pesticide penetration. Check forecast before applying any herbicides.
 - b. Herbicide will not be applied during or immediately prior to extreme rain events
 - c. Do not apply pesticides when wind speeds exceed 10 mph
- 16. The Herbicide Transportation, Handling, and Emergency Spill Response Plan and spill kit will be on-site when herbicide treatment methods occur. This Plan will include reporting procedures, project safety planning, methods of clean-up of accidental spills, and information including a spill kit contents and location as noted in Forest Service Manual (FSM) 2150 (USFS 1994b), Pesticide-Use Management and Coordination and Handbook (FSH) 2109.14 (USFS 1994a). (BMP 15.4, Chem-3, Chem-5, Fac-7)
 - a. No more than daily use quantities of herbicides will be transported to the project site. The exception is for crews staging in remote locations. Under these circumstances, they can bring sufficient quantities of herbicides to last for the planned duration of the field work (i.e., multiple days).
 - b. Equipment used for transportation, storage, or application of herbicides will be maintained in a leak-proof condition.
 - c. Herbicide containers must be secured and prevented from tipping during transport.

- d. To reduce the potential for spills, impervious material, such as a bucket or plastic, will be placed beneath mixing areas in such a manner as to contain any spills associated with mixing/refilling.
 - e. Immediate control, containment, and cleanup of fluids and herbicides due to spills or equipment failure (broken hose, punctured tank, etc.) will be implemented. All contaminated materials will be disposed of promptly and properly to prevent contamination of the site. All hazardous spills will be reported immediately to the Forest Hazardous Spill Coordinator.
 - f. Herbicide spray equipment will not be washed or rinsed within 150 feet of any body of water or stream channel. All herbicide containers and rinse water will be disposed of in a manner that would not cause contamination of waters.
 - g. Mixing and loading of herbicide(s) will take place a minimum of 150 feet away from any body of water or stream channel unless prior approval is obtained from a Forest Service hydrologist or biologist.
17. Whenever herbicide applications are planned at recreation sites, public notices of upcoming herbicide spraying will need to be posted in the local media (newspaper and radio) as well as onsite notifications to inform and educate the public about the activity at the site. All weed control activities should be planned around low use times as much as possible. For example, work should be completed during the week instead of on weekends or during holidays.

Large Wood Placement

A Forest Service fisheries technician, fisheries biologist, or hydrologist would be on-site during the implementation of the proposed activities. These individuals would inspect and monitor construction activities to ensure proper implementation and take appropriate action to reduce or eliminate negative effects to resources.

The following project design features would help prevent potential effects of the proposed work:

- 18. A pre-work meeting with contractors would be conducted to review key project design features.
- 19. Rootwad trees would be harvested according to guidelines established during similar restoration projects on Harris River, 12-Mile Creek and Gandlaay Haanaa (formerly Fubar Creek) on Prince of Wales Island, West Fork Saginaw Creek, South Fork Kadake Creek, and Josie Creek on Kuiu Island, and Sitkoh River near Sitka, Alaska (Landwehr 2009). All harvest locations would be rehabilitated with slash following tree removal.
- 20. Rootwads and rootwad trees would be harvested from a weed free site.
- 21. Oil pollution prevention and contingencies would be in place. Equipment would be fueled a minimum of 150 feet from an active stream channel. Detailed equipment refueling plans would be considered prior to work commencement (BMP 12.8; 12.9; National BMP Road-10).
- 22. Equipment access trails used during the project would be closed upon project completion and would be covered in slash to minimize erosion and soil compaction in areas where equipment operates, or where mineral soils are exposed to encourage natural regeneration (BMP 12.17; National BMP # Road-2). No roads would be constructed for this project.
- 23. Areas of bare ground resulting from construction activities where slash is not available, and all disturbed waterways would be replanted with salmonberry (*Rubus spectabilis*) and willow (*Salix sitchensis*) cuttings. Replant salmonberry throughout the floodplain in the spring prior to

- budburst. Consider other options for revegetation using local seed sources. (BMP 12.17; National BMP Veg-2).
24. Subsoiling (shallow trenching) would only be used in areas where the risk of intercepting subsurface flow is minimal.
 25. Petroleum-based hydraulic fluid in heavy equipment is replaced with vegetable-based hydraulic fluid to protect water quality in the event of a spill. Spill containment kit would be kept on site (BMPs 12.8; 12.9; National BMP AqEco-2; Road-3).
 26. In-channel construction activities are subject to fish timing windows and would be determined in consultation with the Alaska Department of Fish and Game, Habitat Division as per the Title 16 Memorandum of Understanding (BMPs 14.6, 18.3; National BMP AqEco-2; Road-3).
 27. Equipment use in live streams would be kept to a minimum. To the extent possible, equipment would be limited to puncheon trail surfaces and gravel bars, only accessing the active flow channel when necessary to perform detailed site-specific construction (BMPs 14.6, 14.14; 18.3; National BMP AqEco-2; Road-3).
 28. Equipment would not be stored, maintained or repaired within the stream channel or floodplain (BMP 14.14; National BMP Road-9; Fac-2).
 29. Where feasible or advisable, active flow channel work sites would be dewatered. Fish would be removed from the dewatering area prior to dewatering of the site (BMP 14.15).
 30. An erosion/sediment control plan would be created prior to project construction as part of the construction contract. Erosion control devices such as silt fence would be used to protect water ways from sediment impacts (BMP 14.5; National BMP AqEco-2).
 31. All equipment would be cleaned prior to being brought on site to reduce the potential for invasive plant introduction (BMP 14.14; National BMP Fac-7). During implementation, ensure that clothing, footwear, materials, equipment and tools used in the project area are free of invasive plants (BMP Veg 8).
 32. Areas suitable for staging construction materials and equipment would be identified on site prior to implementation (BMP 12.8; 14.14; National BMP Fac-2).
 33. If heritage resources are discovered during construction, all construction must cease and a Forest Service archeologist must be notified.
 34. All trash accessible from equipment access trails or transportable by hand would be removed to a landfill.
 35. If previously undiscovered sensitive or rare plants are encountered prior to or during implementation, protect the population and avoid disturbance in the area containing the population (and similar habitats in that vicinity). Notify a Forest Service Botanist/Ecologist immediately to evaluate the population and recommend further avoidance or mitigation measures.
 36. Thoroughly evaluate topsoil if imported from outside the project area to ensure the source is weed-free.
 37. Consider implementing restoration activities from June to early July to minimize the potential for transporting viable invasive seed sources to the restoration site.
 38. The footprint of ground disturbance in and adjacent to the channel would be minimized. (BMPs 13.2; 14.14).

39. Riparian vegetation disturbance would be minimized and rehabilitated following completion of the project. (BMPs 12.4; 12.5; 12.6; 12.17; 13.2).
40. Punchon access trails used during the project will be closed upon project completion and the punchon routes will be covered in slash to prevent erosion, soil compaction, and off-road travel in areas where equipment operates or where mineral soils are exposed, and “fluffed” afterward to encourage natural regeneration. (BMPs 12.17; 13.2; 14.11).
41. Limits of each fish structure site will be clearly identified in the field by staking, and/or flagging. (BMP 14.14).
42. Ground based equipment used within the stream channel will use nontoxic, biodegradable hydraulic fluid. Spill containment kit will be kept on site. (BMPs 12.8; 12.9).
43. Work during rainfall events will be avoided to the extent practicable, and work will be conducted during lower water conditions in June and July. (BMPs 14.6; 14.14).
44. All instream work will be conducted within fish timing windows established through Title 16 consultation with ADF&G. (BMPs 14.6; 14.14, 18.3).
45. Silt fencing and weed free whattles will be applied at stream entrance and egress points, and in areas adjacent to the stream to minimize sedimentation to the extent possible. Water diversion will not occur for this project, since channel reconstruction is not anticipated and instream impacts are expected to be short-term. (BMPs 12.17; 14.11, 18.3).
46. All mitigation measures or BMPs are enforceable through contract specifications.

Red Pipe Replacement

47. Work during rainfall events will be avoided to the extent practicable, and work will be conducted during lower water conditions in June and July. (BMPs 14.6; 14.14, 18.3).
48. All instream work will be conducted within fish timing windows established through Title 16 consultation with ADF&G. (BMPs 14.6; 14.14, 18.3).
49. Design flow should be based upon design life and risk acceptable to the approving line officer. Stream crossing structures will be designed to provide the most efficient drainage facility consistent with resource protection (for example, fish passage), importance of the road, legal obligations, and total costs. The design may involve a hydrologic analysis to determine conditions that may affect water quality (for example, runoff rates and volumes, flood conditions, flow velocities, sedimentation, scour, and approach and exit channel equilibriums).
50. System roads will have bridges designed to pass a selected (normally 50 to 75 year) flood event. Culverts for Class I, II and III streams will be designed to pass an appropriate (normally 50 year) flood event, with allowance for expected bed load sediments and floating debris. Where practicable, allowance should be made to minimize stream width restrictions. Design structures to minimize streambed and stream bank erosion. Bridges, bottomless arches, pipe arches and oversized buried pipes are the preferred structure on Class I and II streams. (BMPs 14.17)

Road Obliteration

51. Work during rainfall events will be avoided to the extent practicable, and work will be conducted during lower water conditions in June and July. (BMPs 14.6; 14.14, 18.3).

52. All instream work will be conducted within fish timing windows established through Title 16 consultation with ADF&G. (BMPs 14.6; 14.14, 18.3).
53. Effective obliteration is achieved by blocking access, removing all culverts and bridges, and restoring the natural surface and subsurface drainage patterns (BMP 14.24). In addition, the following measures may be done:
 - a. Reshape and stabilize side slopes.
 - b. Remove rock overlay down to the elevation of the adjacent terrain.
 - c. Rip sub grade where compaction is identified as a problem.
 - d. Revegetate the site (grass, browse, or trees).

OHV Trail

54. Work during rainfall events will be avoided to the extent practicable, and work will be conducted during lower water conditions in June and July. (BMPs 14.6; 14.14, 18.3).
55. All instream work will be conducted within fish timing windows established through Title 16 consultation with ADF&G. (BMPs 14.6; 14.14, 18.3).
56. Design flow should be based upon design life and risk acceptable to the approving line officer. Stream crossing structures will be designed to provide the most efficient drainage facility consistent with resource protection (for example, fish passage), importance of the road, legal obligations, and total costs. The design may involve a hydrologic analysis to determine conditions that may affect water quality (for example, runoff rates and volumes, flood conditions, flow velocities, sedimentation, scour, and approach and exit channel equilibriums).
57. System roads will have bridges designed to pass a selected (normally 50 to 75 year) flood event. Culverts for Class I, II and III streams will be designed to pass an appropriate (normally 50 year) flood event, with allowance for expected bed load sediments and floating debris. Where practicable, allowance should be made to minimize stream width restrictions. Design structures to minimize streambed and stream bank erosion. Bridges, bottomless arches, pipe arches and oversized buried pipes are the preferred structure on Class I and II streams. (BMPs 14.17)
58. A number of measures can be used alone or in combination to control erosion in ditches and at culvert outlets. Methods used to control water and reduce erosion may include: properly spaced and sized culverts, catch basins, ditch-blocks, cross drains, water bars, rolling dips, energy dissipaters, aprons, gabions, and armoring of ditches and drain inlets and outlets. Dispersal of runoff can also be accomplished by rolling the grade, crowning, in sloping, out sloping, or installation of water spreading ditches. (BMPs 14.9)

3-Sided Shelter

59. Mitigation measures needed to protect soil and water resources to meet State water quality standards will be included in the planning process (BMP 14.25 & 16.1).
 - a. Pamphlets, brochures, and other material will be used to encourage public cooperation in protecting water quality. Forest Officers can issue citations to violators who cause resource damage.
 - b. Where practicable, locate recreation facilities 100 feet from perennial streams and other water-bodies.

- c. The design, construction and maintenance of recreational facilities will be consistent with standard engineering practices to minimize adverse impacts to the soil and water resources (see BMP 14.29).
- d. For contracted projects, compliance with both environmental analysis requirements and contract specifications must be assured by the Contracting Officer.
- e. Erosion control measures will be implemented to mitigate unacceptable disturbance (see BMP 12.12).

Silviculture

- 60. Avoid damaging advance spruce regeneration during puncheon trail placement and harvesting of puncheon trail material. Use spruce for puncheon only when absolutely necessary.
- 61. Consult with district foresters on tree selection for harvest trees.
- 62. Priority will be to target trees of high defect, that show sign of disease, and have a low commercial value, regardless of species. However, when trees of comparable defect are being considered the priority for species removal will be (from highest to lowest): red alder, hemlock species, shore pine, Alaska yellow-cedar, western redcedar, and Sitka spruce.
- 63. Harvest trees in the lower portions of the canopy first (intermediates and suppressed), and target codominant and dominant trees for removal last.
- 64. Directionally fall all harvest trees to reduce damages to the residual stand.
- 65. Wood would be transported by truck along existing roads Forest Service roads to the restoration Project site, where it would be temporarily decked along FS road 800470 until construction of in stream structures begins. Roads should be kept open for other truck traffic associated with timber operations including firewood removal. The use of the LTF should also allow for other timber operations as necessary.
- 66. Follow guidelines in the Tongass Young Growth Management Strategy (2014) for red alder stand treatment.

Other Measures

- 67. If any previously undiscovered endangered, threatened, candidate or sensitive species or key habitats for any MIS or other species identified in this document are encountered at any point in time prior to or during the implementation of this project, the District Biologist would be consulted and appropriate measures would be enacted.
- 68. A National Pollutant Discharge Elimination System (NPDES) 402 CWA Pesticide Permit will be obtained from the State of Alaska prior to any herbicide use near water bodies. All applicators of herbicides will be certified through the State of Alaska.
- 69. A Pesticide Use Permit (PUP) and an Alaska Pollutant Discharge Elimination System (APDES) permit must be obtained from the State of Alaska Department of Environmental Conservation prior to herbicide use (BMP Chem-1).